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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Charles L. Epstein, et al.

Application No.: 10/538,361

Filing Date: October 20, 2005

For: PRACTICAL PULSE SYNTHESIS VIA THE DISCRETE INVERSE
SCATTERING TRANSFORM

Confirmation No.: Not Yet Assigned

Group Art Unit: Not Yet Assigned

Examiner: Not Yet Assigned

DATE OF DEPOSIT: December 29, 2005

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Dear Sir:

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 CFR § 1.56 and in accordance with 37 CFR §§ 1.97-1.98, information relating to the above-identified application is hereby disclosed. Inclusion of information in this statement is not to be construed as an admission that this information is material as that term is defined in 37 CFR § 1.56(b).

- ☒ In accordance with § 1.97(b), since this Information Disclosure Statement is being filed either within three months of the filing date of the above-identified application, within three months of the date of entry into the national stage of

the above identified application as set forth in § 1.491, before the mailing date of a first Office Action on the merits of the above-identified application, or before the mailing date of a first Office Action after the filing of request for continued examination under § 1.114, no additional fee is required.

- ☐ In accordance with § 1.97(c), this Information Disclosure Statement is being filed after the period set forth in § 1.97(b) above but before the mailing date of either a Final Action under § 1.116 or a Notice of Allowance under § 1.311, or before an action that otherwise closes prosecution in the application, therefore:

☐ Certification in Accordance with § 1.97(e) is attached; or

☐ The fee of \$180.00 as set forth in § 1.17(p) is attached.

- ☐ In accordance with § 1.97(d), this Information Disclosure Statement is being filed after the mailing date of either a Final Action under § 1.113 or a Notice of Allowance under § 1.311 but before, or simultaneously with, the payment of the Issue Fee, therefore included are: Certification in Accordance with § 1.97(e); and the submission fee of \$180.00 as set forth in § 1.17(p).

- ☒ Copies of reference numbers 1 - 19 listed on the attached Form PTO-1449 are enclosed herewith.

- ☒ Copies of reference numbers 20 - 23 on the attached Form PTO 1449 are not required to be submitted pursuant to 37 CFR § 1.98(a)(2)(i).

- ☐ Copies of references - ~ are not being submitted because they were previously cited by or submitted to the U.S. Patent and Trademark Office in patent application number , filed for which a claim for priority under 35 U.S.C. § 120 has been made in the instant application.

☐ The relevance of those listed references which are not in the English language is as follows:

There are no listed references which are not in the English language.

Please charge any deficiency or credit any overpayment to Deposit Account No. 23-3050. This form is submitted in duplicate.

Date: *December 29, 2005*

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Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. UPN-4566/P-3041	Application No. 10/538,361
	Applicant Charles L. Epstein, et al.	
	Filing Date October 20, 2005	Group Not Yet Assigned
	Confirmation No. Not Yet Assigned	
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
1	Ablowitz, M.J., et al., "The inverse scattering transform-fourier analysis for nonlinear problems," <i>Studies in Applied Math</i> , 1974, 53, 249-315	
2	Beals, R., et al., "Scattering and inverse scattering for first order systems," <i>CPAM</i> , 1984, 37, 39-90	
3	Beals, R., et al., "Scattering and inverse scattering for first order systems: II. Inverse Problems," <i>CPAM</i> , 1987, 3, 577-593	
4	Carlson, J., "Exact solutions for selective-excitation pulses," <i>J. of Mag. Res.</i> , 1991, 94, 376-386	
5	Carlson, J., "Exact solutions for selective-excitation pulses. II. Excitation pulses with phase control," <i>J. of Mag. Res.</i> , 1992, 97, 65-78	
6	Faddeev, L., et al., <i>Hamiltonian Methods in the Theory of Solitons</i> , Springer Verlag, Berlin, Heidelberg, NY, 1987, 1-185	
7	Grünbaum, F.A., et al., "An exploration of the invertibility of the Bloch transform," <i>Inverse Problems</i> , 1986, 2, 75-81	
8	Le Roux, P., "Exact synthesis of radio frequency waveforms," <i>Annual Meeting of SMRM</i> , 1988, page 1049	
9	Moses, H.E., et al., "Eigenvalues and eigenfunctions associated with Gel'fand-Levitan equation," <i>J. Math. Phys.</i> , 1984, 25(1), 108-112	
10	Panych, L.P., "Theoretical comparison of fourier and wavelet encoding in magnetic resonance imaging," <i>IEEE Trans. On Med. Imag.</i> , 1996, 15(2), 141-153	
EXAMINER		DATE CONSIDERED





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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
	11	Pauly, J., et al., "Parameter relations for the Shinnar-Le Rous selective excitation pulse design algorithm," <i>IEEE Trans. On Med. Imaging</i> , 1991 , 10, 53-65	
	12	Rourke, D.E., et al., "The inverse scattering transform and its use in the exact inversion of the Bloch equation for noninteracting spins," <i>J. of Mag. Res.</i> , 1992 , 99, 118-138	
	13	Shinnar, et al., "Inversion of the Bloch equation," <i>J. of Chem. Phys.</i> , 1993 , 98, 6121-6128	
	14	Shinnar, M., et al., "The synthesis of pulse sequences yielding arbitrary magnetization vectors," <i>Mag. Res. In Med.</i> , 1989 , 12, 74-80	
	15	Shinnar, et al., "The application of spinors to pulse synthesis and analysis," <i>Mag. Res. In Med.</i> , 1989 , 12, 93-97	
	16	Shinnar, M., et al., "The synthesis of soft pulses with a specified frequency response," <i>Mag. Res. In Med.</i> , 1989 , 12, 88-92	
	17	Widom, H., "The Fredholm Theory," <i>Lectures on Integral Equations</i> , Van Nostrand, Reinhold Co., NY, Toronto, Ont., London, 1969 , Chapter III, 35-44	
	18	Zakharov, V., et al., "Korteweg-de Vries equation, a completely integrable Hamiltonian system," <i>Funk. Anal. Pröz.</i> , 1971 , 5(4), 18-27 (translated pages 280-287)	
	19	Zakharov, V., et al., "On the complete integrability of the non-linear Schrödinger equation," <i>Teor. Mat. Fiz.</i> , 1974 , 19(3), 332-343 (translated pages 551-559)	
EXAMINER		DATE CONSIDERED	



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U. S. PATENT DOCUMENTS

Examiner Initial		Document No.	Date	Name	Class	Subclass
	20	5,153,515	10/06/92	Leigh, et al.	324	307
	21	5,449,376	09/12/95	Callahan	607	2
	22	5,572,126	11/05/96	Shinnar	324	314
	23	5,821,752	10/13/98	LeRoux	324	314

FOREIGN PATENT DOCUMENTS

Examiner Initial		Document No.	Date	Country	Translation	
					YES	NO

EXAMINER

DATE CONSIDERED